

CLAIMS

We claim:

1. A method for determining fault sources for device failures, comprising:

generating failure signatures of fault sources for preselected tests;

generating aggregate failure signatures for individual of said fault sources from said failure signatures;

generating aggregate device test data from test data of a device for said preselected tests;

generating aggregate matches by comparing said aggregate failure signatures with said aggregate device test data; and

determining fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches.

2. The method according to claim 1, wherein said generating failure signatures of fault sources for preselected tests, comprises:

determining potential defect failures by analyzing a physical layout of said device; and

determining failure signatures corresponding to said potential defect failures.

3. The method according to claim 1, wherein said generating aggregate failure signatures for individual of said fault sources from said failure signatures, comprises logically combining failure signatures corresponding to said preselected tests for individual of said fault sources.

4. The method according to claim 3, wherein said logically combining failure signatures corresponding to said preselected tests for individual of said fault sources, comprises logically OR'ing failure signatures corresponding to said preselected tests for individual of said fault sources.

5. The method according to claim 4, wherein said logically OR'ing failure signatures corresponding to said preselected tests for individual of said fault sources, comprises logically OR'ing bitmap patterns defining failure signatures corresponding to said preselected tests for individual of said fault sources by centering said bitmap patterns with respect to each other before said logically OR'ing.

6. The method according to claim 1, wherein said generating aggregate device test data from test data of a device for said preselected tests, comprises logically combining device test data resulting from conducting said preselected tests on said device.

7. The method according to claim 6, wherein said logically combining device test data resulting from

conducting said preselected tests on said device, comprises logically OR'ing said device test data.

8. The method according to claim 7, wherein said logically OR'ing said device test data, comprises logically OR'ing bitmap patterns of said device test data.

9. The method according to claim 1, wherein said generating aggregate matches by comparing said aggregate failure signatures with said aggregate device test data, comprises searching said aggregate device test data for said aggregate failure signatures.

10. The method according to claim 1, wherein said determining fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches, comprises:

determining a set of fault sources corresponding to said aggregate matches;

for individual of said set of fault sources, comparing test data of said device for individual of said preselected tests against failure signatures of said set of fault sources for said individual of said preselected tests; and

determining said fault sources for said device failures by finding matches through said comparing of said test data against said failure signatures.

11. An apparatus for determining fault sources for device failures, comprising at least one circuit configured to:

generate failure signatures of fault sources for preselected tests;

generate aggregate failure signatures for individual of said fault sources from said failure signatures;

generate aggregate device test data from test data of a device for said preselected tests;

generate aggregate matches by comparing said aggregate failure signatures with said aggregate device test data; and

determine fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches.

12. The apparatus according to claim 11, wherein said at least one circuit is further configured to generate said failure signatures from potential defect failures identified from a physical layout of said device.

13. The apparatus according to claim 11, wherein said at least one circuit is further configured to logically combine failure signatures corresponding to said preselected tests for individual of said fault sources to generate said aggregate failure signatures.

14. The apparatus according to claim 11, wherein said at least one circuit is further configured to logically OR failure signatures corresponding to said preselected tests for individual of said fault sources to generate said aggregate failure signatures.

15. The apparatus according to claim 11, wherein said at least one circuit is further configured to logically OR bitmap patterns defining failure signatures corresponding to said preselected tests for individual of said fault sources by centering said bitmap patterns with respect to each other before said logically OR in order to generate said aggregate failure signatures.

16. The apparatus according to claim 11, wherein said at least one circuit is further configured to logically combine device test data resulting from conducting said preselected tests on said device to generate said aggregate device test data.

17. The apparatus according to claim 11, wherein said at least one circuit is further configured to logically OR bitmap patterns of said device test data to generate said aggregate device test data.

18. The apparatus according to claim 11, wherein said at least one circuit is further configured to:

determine a set of fault sources corresponding to said aggregate matches;

for individual of said set of fault sources,
compare test data of said device for individual of said
preselected tests against failure signatures of said set of
fault sources for said individual of said preselected tests;
and

determine said fault sources for said device
failures by finding matches through said compare of said
test data against said failure signatures.

19. The apparatus according to claim 18, wherein
said at least one circuit comprises a processor.

20. An apparatus for determining fault sources
for device failures, comprising:

means for generating failure signatures of fault
sources for preselected tests;

means for generating aggregate failure signatures
for individual of said fault sources from said failure
signatures;

means for generating aggregate device test data
from test data of a device for said preselected tests;

means for generating aggregate matches by
comparing said aggregate failure signatures with said
aggregate device test data; and

means for determining fault sources for device
failures by comparing said test data of said device with
ones of said failure signatures of fault sources
corresponding to said aggregate matches.

100350381.01 PAGE 2